RBCA for learning and culture

AfricaRice seeks support from African governments and donors to turn the RBCA into a veritable learning and a value-addition center for traditional rice varieties in Africa in close association with the farmers' organizations (FOs), who often have indigenous knowledge of specific qualities of traditional rice varieties.

Through displays and exhibits and interactive learning facilities, visitors, including youth, will understand and appreciate the role rice plays in ensuring food security, the importance of farmers as saviors of traditional rice varieties, rice customs and traditions, and the need for safeguarding rice diversity *ex-situ* and *in-situ*.

Visitors to the RBCA will have a memorable learning experience and desire to contribute to conservation and value-addition efforts of rice genetic resources. The RBCA will not, however, only focus on the past but will also be a forward-looking learning center, giving information on the use of the genetic resources for rice research-for-development.

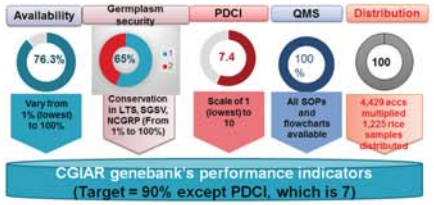
Funding support

The establishment of the genebank of the RBCA is the result of the cooperation between the CGIAR Genebank Platform, the Global Crop Diversity Trust, the African Development Bank and member countries of AfricaRice, for a total investment of about one million US dollars (US$1 million). It is a valuable research asset for the entire world and for Africa in particular, in the realization of the global objectives of food and nutrition security and poverty alleviation.

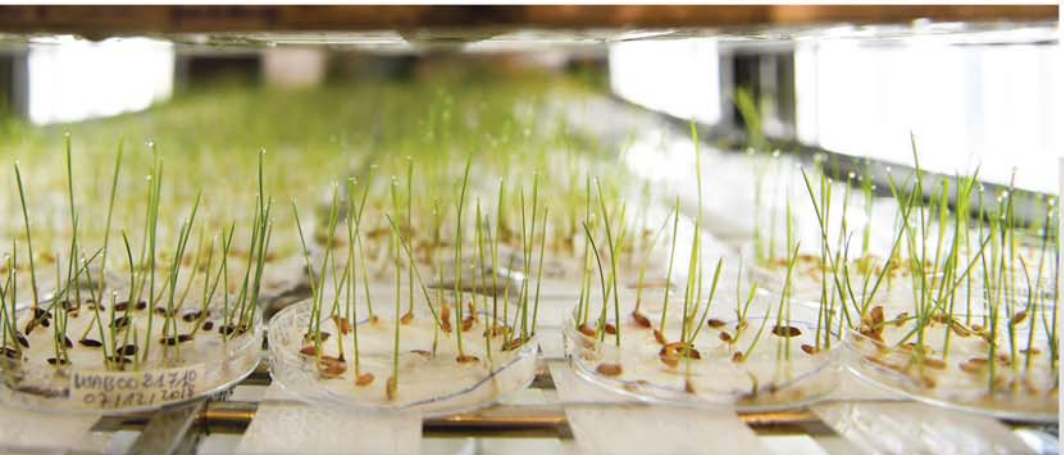
Main activities at the Rice Biodiversity Center for Africa

Performance Target indicators	Major research areas to promote use
1. Germplasm availability	1. Use of genomics for germplasm characterization
2. Germplasm security (Safety duplication or Safety backup)	2. Creating subsets for phenotypic evaluation
3. Passport Data Completeness Index (PDCI)	3. Gene discovery
4. Quality Management System	4. Trait donor identification
5. Germplasm distribution to users (diversity and quantity)	5. Pre-breeding

Summary of major routine operations at the end of 2019



Photos : Neil Palmer, Crop Trust



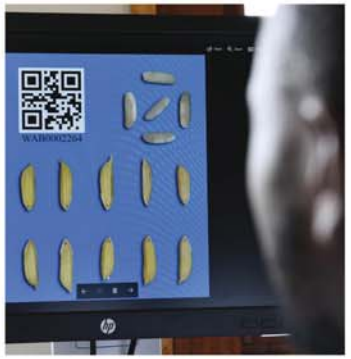
Rice Biodiversity Center for Africa (RBCA)

CGIAR · CROP TRUST · AfricaRice

Africa's rich rice heritage

Africa has a rich rice heritage that many people are not aware of. Africa is the only continent where the world's two species of cultivated rice are grown: *Oryza sativa*, commonly known as Asian rice, which was domesticated in Asia, and *O. glaberrima*, African rice, which was domesticated over 3,000 years ago in the Inner Niger Delta in northern Mali.

According to some historians, the African rice was one of the main staples of Ghana, Mali, and Songhai in West Africa. Today, however, it is an endangered species – grown only in pockets of West Africa for ceremonial and cultural values. A few farmers continue to grow it because it is better adapted to various local stresses than modern varieties.



Crop diversity

Many traditional varieties, such as the African rice, that were an integral part of our agricultural heritage, are disappearing. This loss of crop diversity affects not only farmers, but also the global agri-food system. Crop diversity is fundamental to food and nutrition security and is a powerful weapon in the fight against hunger and poverty.

Plant genetic resources provide the raw material for crop improvement programs. Genebanks have been established with the long-term mission to preserve ex-situ collections of crop diversity for use by present and future generations for crop improvement to the benefit of farmers and consumers.

Rice Biodiversity Center for Africa (RBCA)

The RBCA aims to enhance opportunities for AfricaRice to assume a continental leadership role in efforts to unlock rice genetic resources, stimulate much greater use of these resources in Africa and enable African countries to meet the challenge of sustainably producing quality rice for the growing population.

The major functions of the RBCA relating to its collection of rice genetic resources include germplasm conservation, regeneration, multiplication, characterization, evaluation and distribution including compliance with international regulations and responding to individual requests from users across the world. With support from the Crop Trust, the RBCA has put in place key components of quality management, such as standard operating procedures (SOPs) as well as risk assessment and mitigation plans.

RBCA for conservation of rice genetic resources

The genebank of the RBCA is one of the 11 international CGIAR genebanks, which operates within the framework of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA). AfricaRice is unique in representing an association of 28 African countries, on whose behalf it conserves its collection of rice genetic resources in trust for humanity and makes it available to all. AfricaRice carries out this mission in partnership with national programs and international organizations.

The genebank holds the largest collection of African rice in the world and the largest rice collection in Africa with almost 22,000 accessions in an ultra-modern infrastructure. The facility has the capacity to conserve under optimal conditions, up to 60,000 rice accessions. Eighty-five percent of its collection have originated in Africa.

In addition to the two cultivated rice species, its collection includes related wild species in Africa. The rice genetic resources are key to developing new varieties adapted to African agro-ecologies. In 2018, AfricaRice moved its entire rice germplasm collection from Benin and Nigeria back to its new facility in M'bé – a landmark in the history of AfricaRice.

The genebank uses a two-tiered storage concept: an 'active' collection for distribution or research and a 'base' collection for long-term storage. With the support CGIAR Genebank Platform, AfricaRice also 'safety duplicates' material in long-term mega-stores in Fort Collins, Colorado, and in the Svalbard Global Seed Vault, Norway.

Tapping a genetic goldmine

AfricaRice has been a pioneer in systematically characterizing its African rice collection and tapping into its rich reservoir of genes for resistance to several local stresses. Although the African rice has lower yields, it is known for its toughness, which makes it an especially useful genetic resource for developing stress-tolerant rice varieties for rainfed ecosystems in Africa.

Some of the African rice materials were used as donor parents in developing the 'New Rice for Africa' (NERICA) varieties in the 1990s and 2000s, and the Advanced Rice for Africa (ARICA) varieties in the 2010s. The NERICA varieties were the first wide-scale success of crossing of the two cultivated species.

RBCA for utilization of genetic resources

Variation present in accessions of the collection can best be used in plant improvement when it is properly characterized. Characterization and evaluation of crop diversity are among the main activities at the RBCA in collaboration with the AfricaRice breeders. Emphasis is given to the screening for resistance to major diseases, pests and environmental stresses. The RBCA is collaborating in studies to use high-throughput precision phenotyping to identify further useful traits.

RBCA for generating information

The RBCA generates information on the collection of widely available rice accessions. Passport and minimum characterization data of its accessions are now available via the Crop Trust's Genesys database and the Germplasm Resource Information Network (GRIN-Global).

RBCA for supporting countries

On request, the RBCA restores lost crop diversity to countries affected by war. It provides backstopping to national programs relating to conservation and is also involved in capacity development.

RBCA for education and culture

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